



NC National Estuarine Research Reserve Education Market Analysis Results

The North Carolina National Estuarine Research Reserve conducted a market analysis of agencies within North Carolina that provide formal education, informal education and/or outreach related to estuaries and the coastal environment to identify gaps in the existing programs offered to the teachers and students of the 20 coastal NC counties.

We were particularly interested in science-based information offered in the form of:

1. professional teacher training opportunities
2. educational workshops
3. outreach programs
4. educational materials
5. other educational products or services.

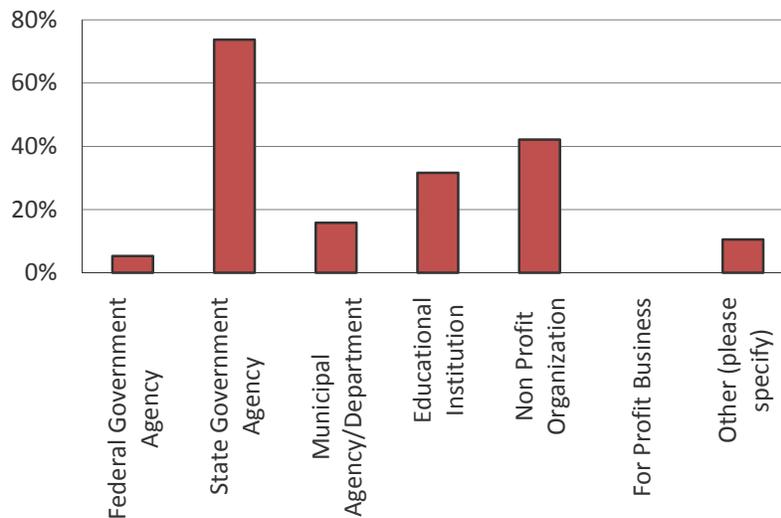
RESULTS:

Agency Information

A total of 19 responses were collected from 49 email invitations for a response rate of 32%.

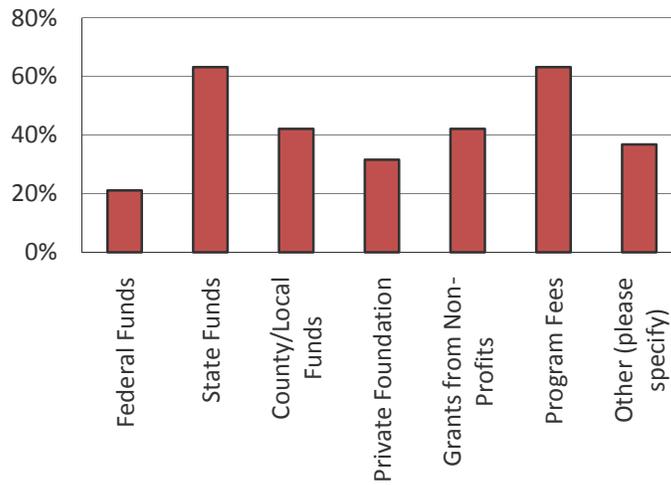
We had respondents from federal, state and city government agencies, educational institutions and non-profit organizations (Fig. 1).

Figure 1: Type of Organization



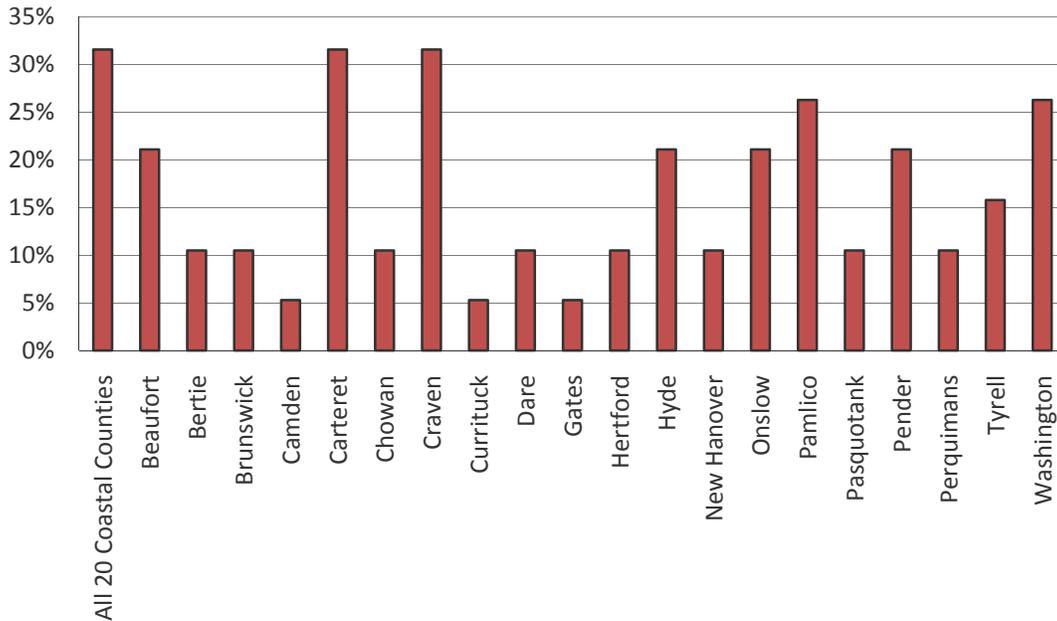
Agencies receive funding from a variety of sources. Over 60% of agencies fund their programs through state funds or program fees (Fig. 2).

Figure 2: Funding Sources



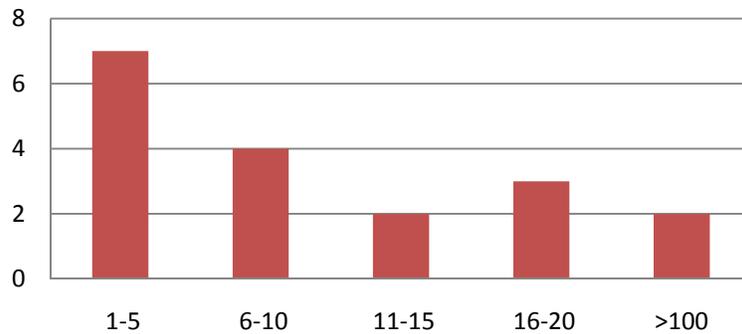
We were interested in which coastal counties were being covered by existing educational programs. Those counties who are served by at least 20% of the respondents include Beaufort, Carteret, Craven, Hyde, Onslow, Pamlico, Pender and Washington. The counties with the least amount of program coverage include Camden, Currituck, and Gates. However, 30% of respondents cover all 20 coastal counties (Fig. 3).

Figure 3: Counties Served by Educational Programs



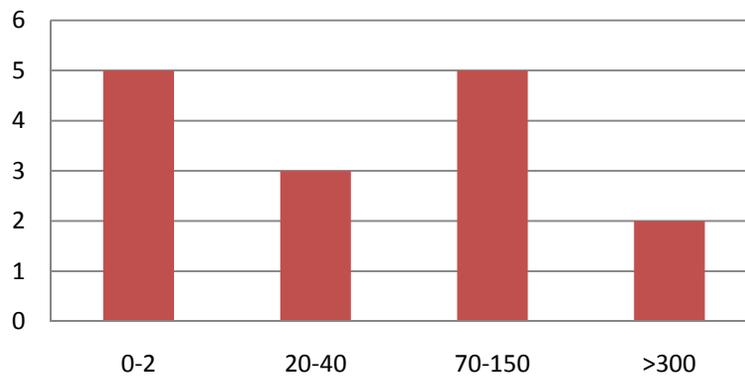
The majority of those surveyed are from smaller organization with 5 or fewer employees. Only 2 agencies have greater than 100 employees (Fig. 4).

Figure 4: Number of Employees (Full- and Part-time)



While many respondents (5) have 2 or fewer volunteers, the majority have greater than 20 volunteers (Fig. 5). Two agencies surveyed had a very large volunteer base of over 300 individuals.

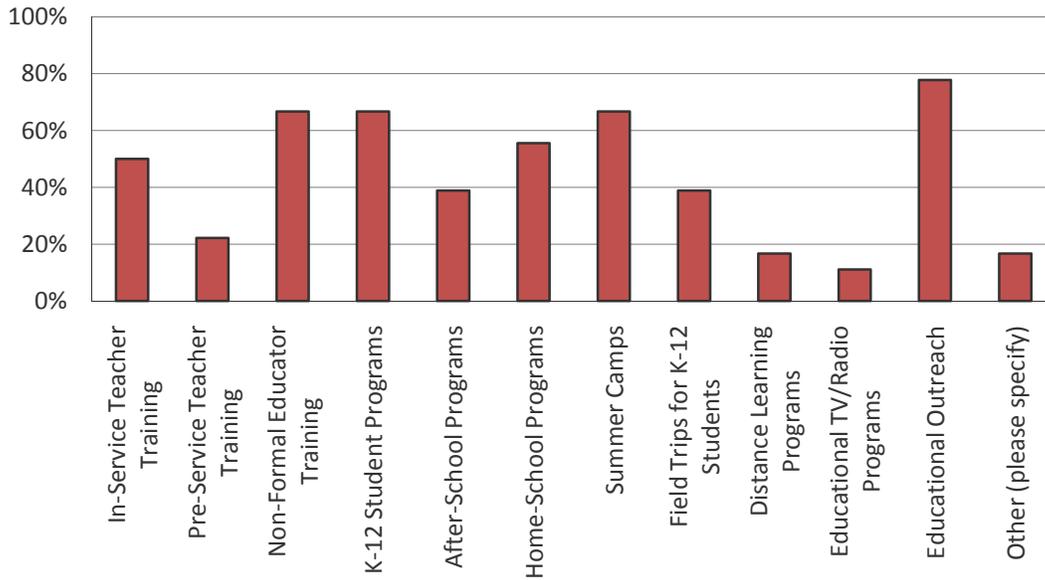
Figure 5: Number of Volunteers



Educational Programs

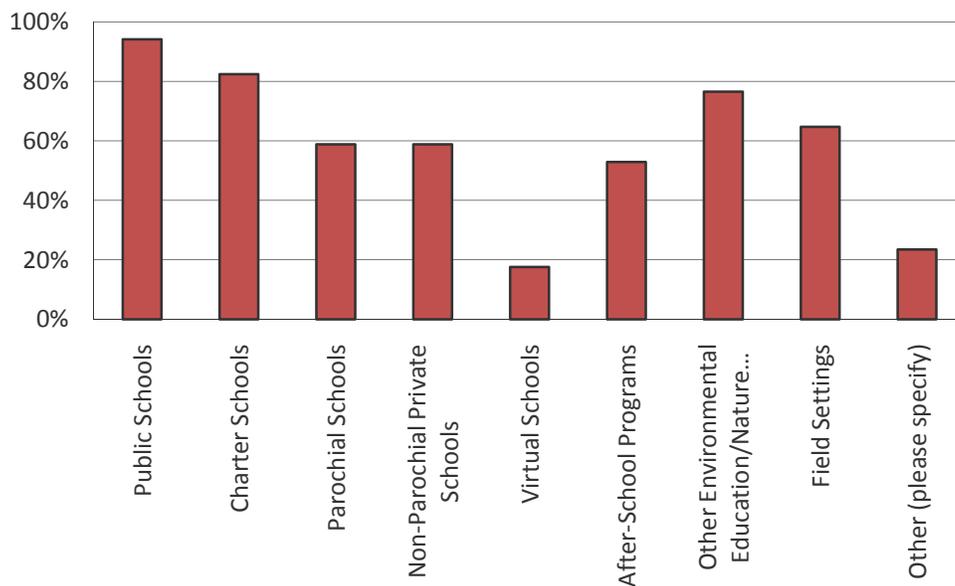
Almost 80% of agencies surveyed provide outreach of some type. Over 60% of respondents provide educator training, K-12 programs and summer camps (Fig. 6). Fewer respondents provide distance learning programs or educational TV/radio programs.

Figure 6: Types of Educational Programs



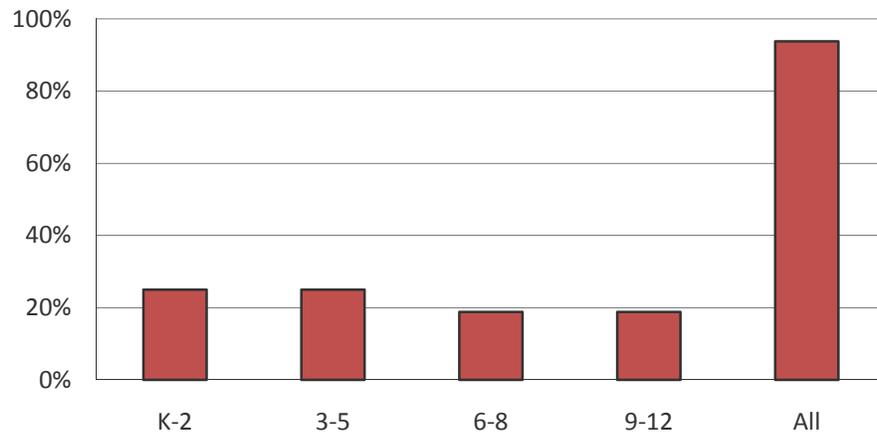
94% of Respondents provide outreach to public schools. The other most common settings for outreach programs are Charter Schools (82%) and Environmental Education/Nature Centers (77%) (Fig. 7).

Figure 7: Outreach Settings



Most agencies surveyed serve all grade levels (Fig. 8).

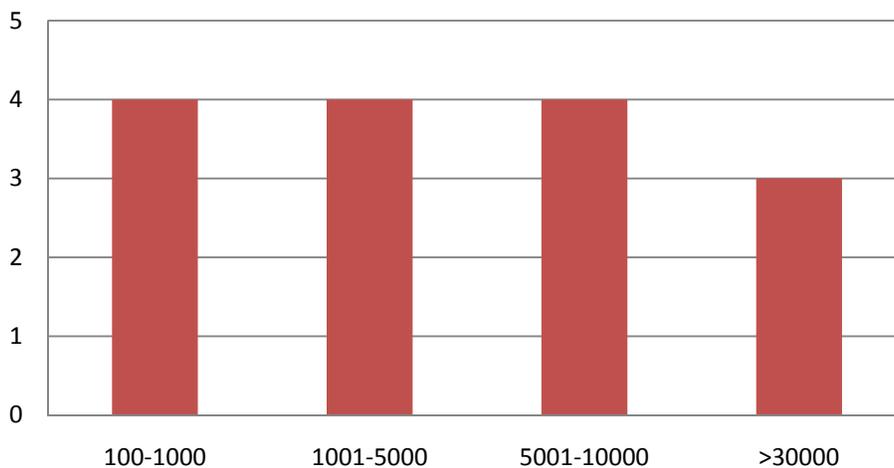
Figure 8: Grade Levels Target by Programs



Respondents were asked how many K-12 education programs their organization conducted during the previous year. The answers varied from under 10 to over 1000. Two agencies conducted over 1000 programs, 1 conducted 650, 4 conducted between 75 and 200, 2 conducted between 30 and 60, and 4 agencies conducted fewer than 15 programs.

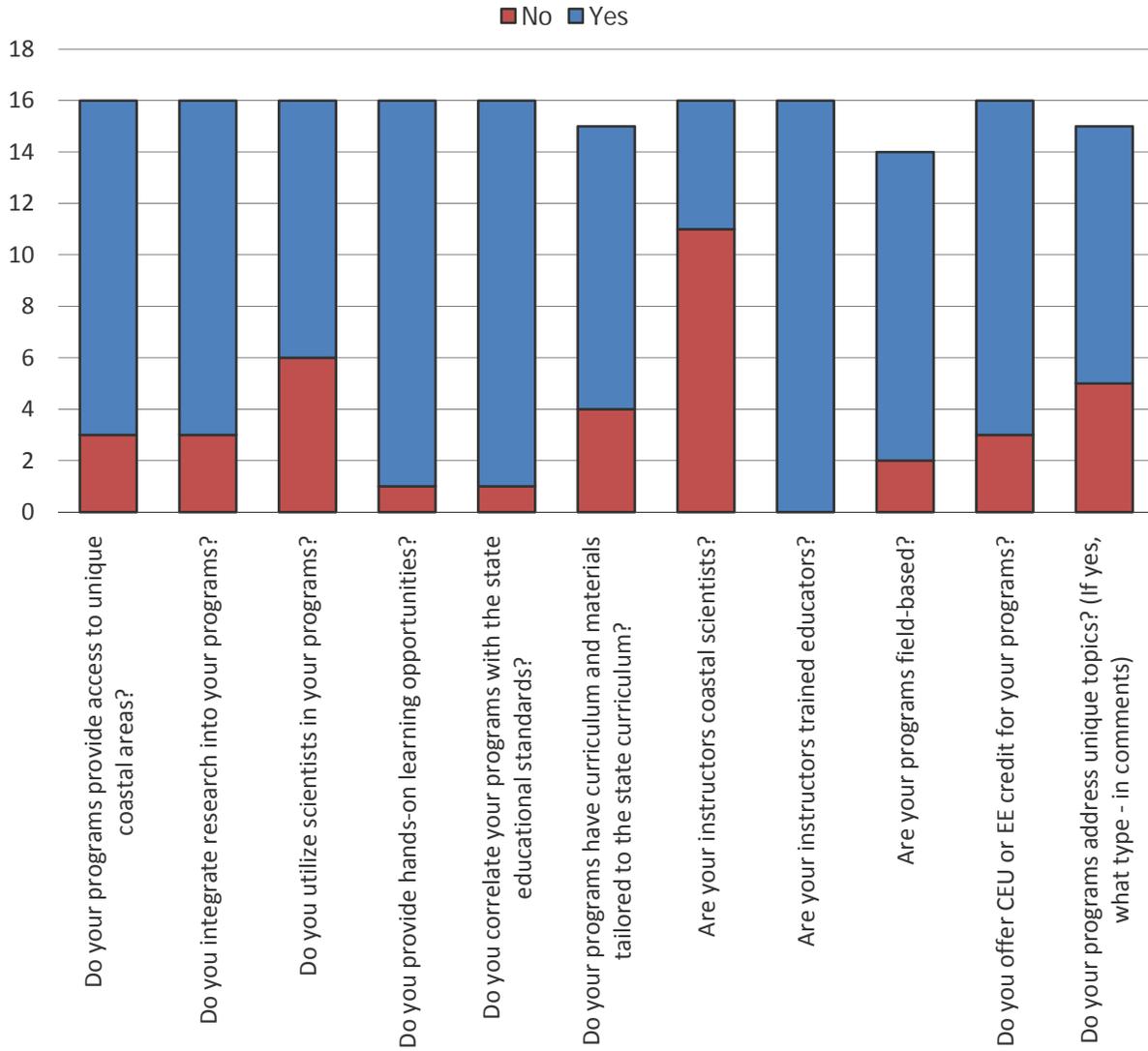
The average number of participants per program varied from 20 to 150. The approximate number of students reached by K-12 education programs by respondents is shown in the following graph (Fig. 9). The agencies that reach the greatest number of students are the NC aquariums and the Museum of Natural Sciences.

Figure 9: Number of Students Reached



Respondents were asked a series of questions about their educational programs. Several patterns were evident (Fig. 10). All agencies represented use trained educators, but few of the educators are coastal scientists. Most agencies provide field-based, hands-on training that correlates with the state educational standards. Most agencies also provide access to unique coastal areas, integrate research into programs, and offer CEU or EE credit for programs.

Figure 10: Educational Program Details



Educational Topics

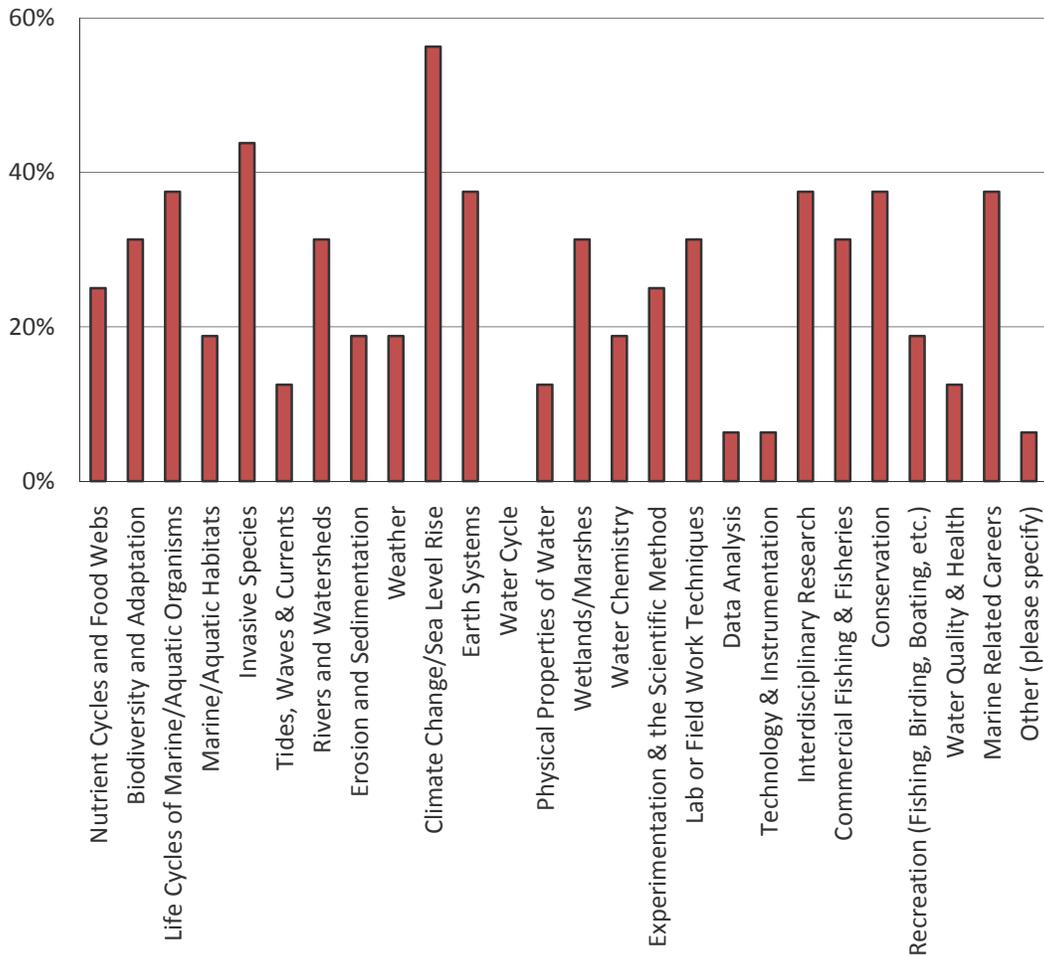
We were interested in what topics are being covered and in which grade level. The most commonly addressed topics in education programs (covered by over 80% of respondents) are wetlands/marshes, conservation and marine/aquatic habitats (Table 1). The topics receiving the least amount of attention (<30%) include experimentation and the scientific method, technology and instrumentation, and the physical properties of water.

Table 1: Topics Addressed in Educational Programs

Answer Options	K-2	3-5	6-8	9-12	Adult	Response Count
Wetlands/Marshes	10	10	12	11	11	13
Conservation	9	10	12	11	11	13
Marine/Aquatic Habitats	9	10	12	11	9	12
Recreation (Fishing, Birding, Boating, etc.)	6	6	8	9	11	11
Water Quality & Health	3	5	9	8	9	11
Nutrient Cycles and Food Webs	9	9	7	5	6	10
Biodiversity and Adaptation	8	8	8	6	6	10
Life Cycles of Marine/Aquatic Organisms	7	9	10	9	7	10
Rivers and Watersheds	4	5	9	6	7	10
Water Cycle	7	7	9	6	7	10
Erosion and Sedimentation	4	4	8	6	6	9
Data Analysis	0	1	6	6	6	9
Invasive Species	3	4	6	5	5	7
Tides, Waves & Currents	1	2	7	5	5	7
Water Chemistry	1	3	7	4	3	7
Lab or Field Work Techniques	2	4	6	6	5	7
Climate Change/Sea Level Rise	2	3	5	6	5	6
Interdisciplinary Research	1	1	5	4	6	6
Commercial Fishing & Fisheries	2	3	6	6	5	6
Weather	4	4	5	5	5	5
Earth Systems	2	5	3	3	2	5
Marine Related Careers	0	1	4	5	2	5
Experimentation & the Scientific Method	1	3	4	2	2	4
Technology & Instrumentation	0	0	2	1	3	4
Physical Properties of Water	1	1	2	2	2	3

We asked respondents which educational topics need more attention from educational programs. The two most common responses were climate change/sea level rise and invasive species (Fig. 11). Topics which fewer than 10% of respondents felt needed more attention included the water cycle, data analysis, and technology and instrumentation.

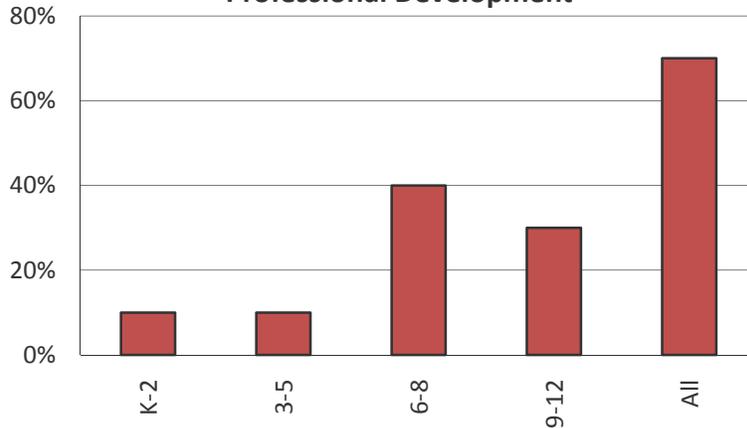
Figure 11: Topics Needing More Attention



Teacher Professional Development

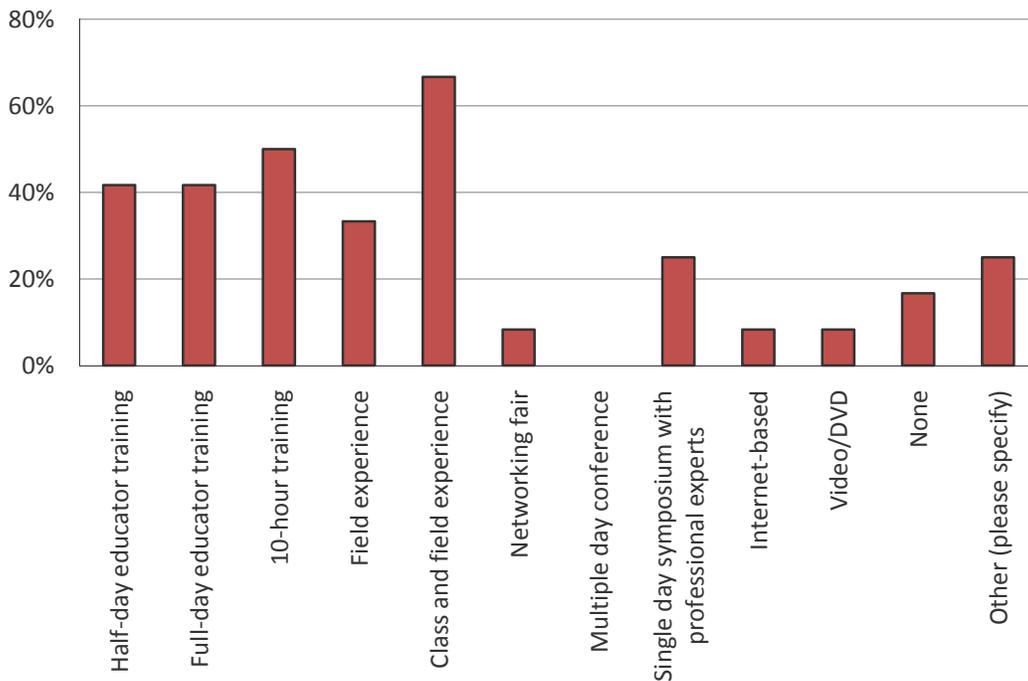
Most agencies provide teacher professional development to teachers of all grade levels. In general, however, elementary school teachers are the least targeted for professional development programs (Fig. 12).

Figure 12: Teacher Grade Levels Targetted for Professional Development



The most common types of professional development activities include class/field experiences, half-day training, full-day training, 10-hour training, and field experience (Fig. 13). Less utilized were network fairs, multiple day conferences, internet-based training, and video/DVDs.

Figure 13: Type of Teacher Professional Development Provided



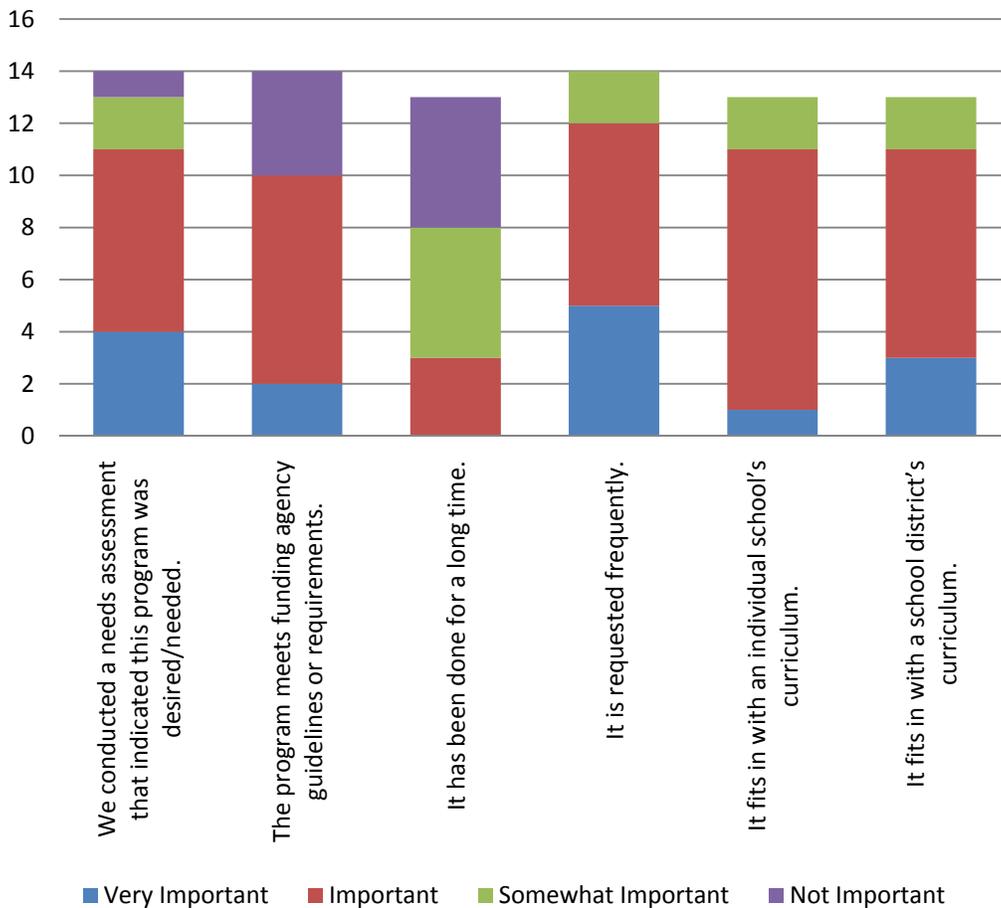
Program Development/Marketing

33% of respondents have plans to expand existing teacher professional development programs. Plans for expansion include new topical workshops and formalizing existing workshops for easier access to CEU credit and Criteria I credit for the NC Environmental Education certification.

50% of respondents have plans to expand K-12 programs/activities. Some of the plans include getting more local schools to participate in programs and outreach, building a Coastal Education Center with plans to hire two educators, and opening a new building to expand programs.

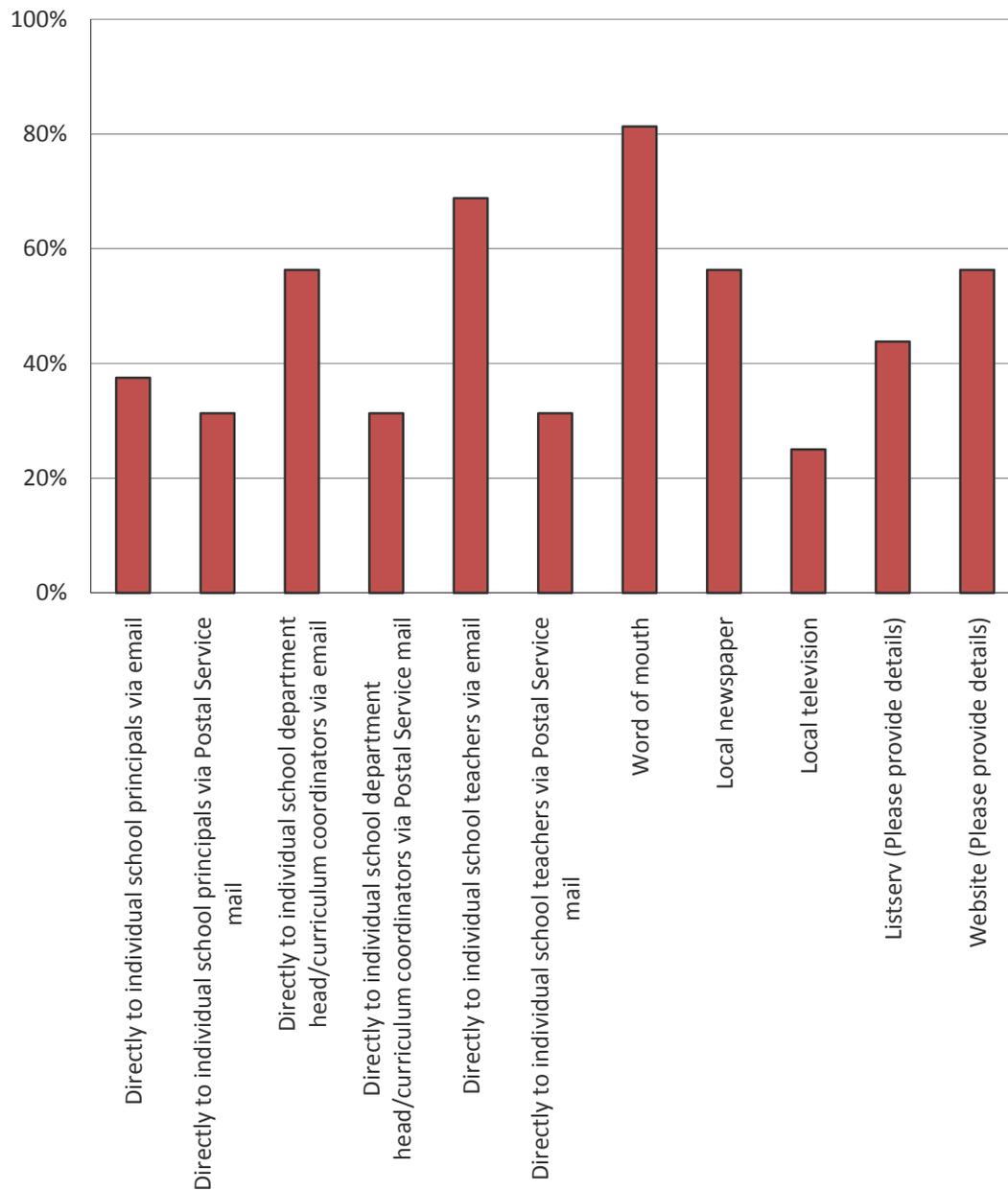
We were also interested in what the motivating factors were in developing programs. Figure 14 illustrates the relative importance of several factors in program development.

Figure 14: Importance in Developing Programs



The most commonly utilized means of advertising programs are word of mouth, direct emails to teachers, through school department heads/curriculum coordinators, through the local newspaper and on the agencies' websites and through the Environmental Education listserv (Fig. 15).

Figure 15: Marketing of Programs

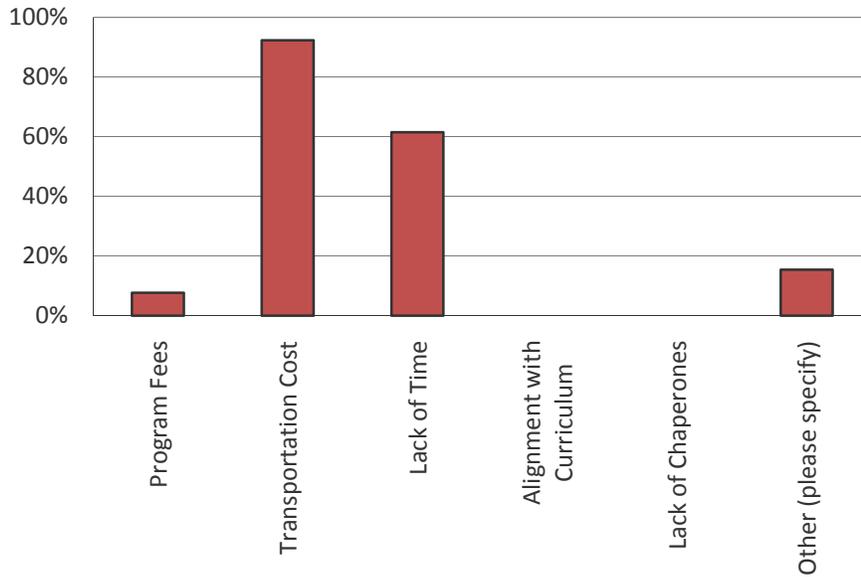


56% of respondents charge fees for their programs. For many agencies the fees vary by program. Some offer free programs once admission is paid. Responses with dollar amounts on a per person basis ranged from between \$2 and \$5.

75% of respondents provide curriculum materials to the teachers.

The largest barrier identified by agencies to attending their programs is the cost of transportation. 92% of respondents identified this as a problem (Fig. 16).

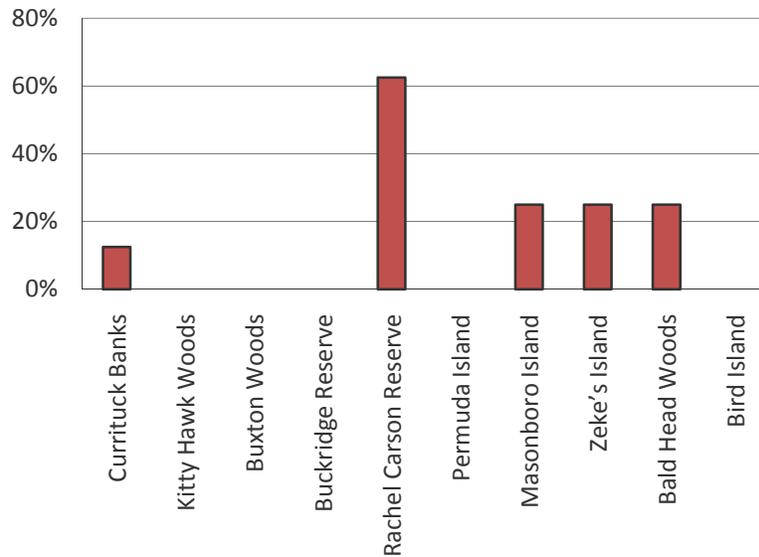
Figure 16: Barriers to Attending Programs



Familiarity with the NC Coastal Reserve

87% of respondents are familiar with the NC Coastal Reserve program, however, 40% of responding agencies have not conducted a program within the Reserve boundaries. Of the 10 NC Coastal Reserve sites, the Rachel Carson component is the most widely visited (Fig. 17).

Figure 17: Reserves Utilized for Educational Programs



Partnerships

81% of respondents currently partner with other agencies. Partner agencies include the following:

- | | | |
|--|-------------------------------------|--|
| APNEP Citizens' Monitoring Network | ECU | NCOEE |
| Audubon Society | NC American Water Works Association | NCSG |
| Bald Head Conservancy | NC Aquariums | NHCSWCD |
| Cool Springs | NC Coastal Federation | NRCS |
| COSEE | NC Dept of Public Instruction | Project Learning Tree/NC Cooperative Extension |
| DESTINY Traveling Science Learning Program | NC History Museum | River Park North |
| Division of Marine Fisheries | NC State Parks | UNCW |
| Division of Water Quality | NC Wildlife Resources Commission | US Fish and Wildlife Service |

69% of respondents were very interested in partnering with other agencies to provide environmental education. 31% were somewhat interested. No one responded that they were not interested.